APPENDIX J-3

Sampling and Analysis Plan

Sampling and Analysis Plan

Quil Ceda Village Wastewater Treatment Plant Effluent Monitoring Program

Submitted by

The Tulalip Tribes
8802 27th Avenue NE
Tulalip, Washington 98271-9715

Prepared by

Parametrix
1231 Fryar Avenue
P.O. Box 460
Sumner, Washington 98390-1516
(253) 863-5128
www.parametrix.com

January 2003
Project No. 216-1598-012 (07/04)

CERTIFICATE OF ENGINEER

The technical material and data contained in this document were prepared under the supervision and direction of the undersigned, whose seal, as a professional engineer licensed to practice as such, is affixed below.

1/6/03

EXPIRES: 01/05/04

Prepared by Lisa A. Gilbert, R. G.

Checked by Kenneth T. Fellows, P.E.

1/6/03

Approved by Michael T. Ollivant, P.E.

TABLE OF CONTENTS

1. INTRODUCTION 1-1

2. SAMPLING AND ANALYSIS SPECIFICS 2-1
   - 2.1 LOCATION AND SAMPLE FREQUENCY 2-1
   - 2.2 SAMPLING METHODS 2-1
     - 2.2.1 Procedures for Sample Collection 2-1
     - 2.2.2 Quality Control Samples 2-3
     - 2.2.3 Documentation 2-4
     - 2.2.4 Sample Handling and Custody 2-4
     - 2.2.5 Groundwater Level Measurement 2-5
   - 2.3 SAMPLE ANALYSES 2-5

3. DATA ANALYSIS AND REPORTING 3-1

4. REFERENCES 4-1

LIST OF TABLES

2-1 Sampling Frequency 2-2

2-2 Sample Containers, Preservatives, and Holding Times 2-5

APPENDICES

A Example Forms

B Standard Operating Procedures

ACRONYMS

EPA	U.S. Environmental Protection Agency
MCL	maximum contaminant level
QAPP	*Quality Assurance Project Plan*
SAP	Sampling and Analysis Plan
TBD	To Be Determined
UV	ultraviolet

1. INTRODUCTION

This Sampling and Analysis Plan has been developed for collection of wastewater effluent samples from the Kubota Membrane wastewater treatment plant operated by Quil Ceda Village.

This Sampling and Analysis Plan (SAP) was prepared considering two discharge options. Initially, the discharge will be routed to subsurface infiltration basins. Later, the discharge may be directed to surface water, if an NPDES Permit is obtained.

2. SAMPLING AND ANALYSIS SPECIFICS

2.1 LOCATION AND SAMPLE FREQUENCY

Wastewater effluent samples will be collected at the wastewater treatment plant at a location selected to represent the quality of effluent that will be discharged to the infiltration area or surface water (as applicable).

The frequency of sampling is indicated in Table 2-1 (see page 2-2). Compounds of concern for surface water discharge will be monitored during effluent infiltration to build a database of results prior to discharge to surface water. Analytical methods are described in Table 2-2 of the QAPP (Parametrix, 2002).

2.2 SAMPLING METHODS

2.2.1 Procedures for Sample Collection

Wastewater effluent samples will be collected directly into prelabeled sampling containers. Therefore no decontamination will be required. Each sample will be labeled, chemically preserved (if required), and sealed immediately after collection.

Prior to the sample event, each sample location will be assigned a unique code. Each sample collected at that location would be preassigned an identification code using the sample location followed by other specific information describing the sample. The following example illustrates the sample identification system:

EF-122002-001-0,

Where:

EF	=	Effluent
122002	=	Date
001	=	Station Number
0	=	Code indicating whether the sample is a duplicate, where 0 is assigned for the sample, and 1 is assigned for a duplicate sample.

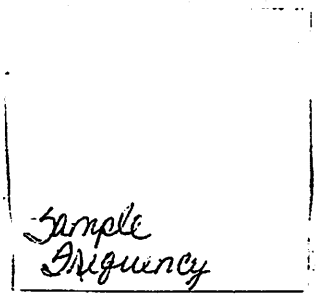
Sample
Frequency

Table 2-1. Sampling Frequency

Parameter or Parameter Group	Sampling Frequency During Discharge to Effluent Infiltration System	Sampling Frequency During Discharge to Surface Water[a]
Groundwater Level Measurements	Weekly (N1 through N10, S1 through S9, and B1 through B6, and P3).	None
Instrument Parameters		
Dissolved oxygen	Weekly	To Be Determined (TBD)
pH	Weekly	TBD
Specific conductance	Weekly	TBD
Turbidity	Continuous[b]	TBD
Conventional Parameters		
Alkalinity	Monthly for first year of operation	TBD
Ammonia	Weekly	TBD
BOD5	Weekly	TBD
Coliform, Fecal	Weekly	TBD
Coliforms, Total	First week, at 6 months, at 12 months	TBD
E. coli	First week, at 6 months, at 12 months	TBD
Cyanide	First week, at 6 months, at 12 months	TBD
Hardness	Monthly	TBD
Nitrate	Weekly	TBD
Nitrite	Weekly	TBD
Phosphorous	First week, at 6 months, at 12 months	TBD
TKN	Weekly	TBD
TSS	Monthly for first year of operation. Use turbidity as surrogate thereafter.	TBD
Metals		
Antimony	Monthly for first 3 months[c]	TBD
Arsenic	Monthly for first 3 months[c]	TBD
Barium	Monthly for first 3 months[c]	TBD
Beryllium	Monthly for first 3 months[c]	TBD
Cadmium	Monthly for first 3 months[c]	TBD
Chromium	Monthly for first 3 months[c]	TBD
Copper	Monthly for first 3 months[c]	TBD
Lead	Monthly for first 3 months[c]	TBD
Mercury	Monthly for first 3 months[c]	TBD
Nickel	Monthly for first 3 months[c]	TBD
Selenium	Monthly for first 3 months[c]	TBD
Silver	Monthly for first 3 months[c]	TBD
Thallium	Monthly for first 3 months[c]	TBD
Zinc	Monthly for first 3 months[c]	TBD

(Table Continues)

Table 2-1. Sampling Frequency (Continued)

Parameter or Parameter Group	Sampling Frequency During Discharge to Effluent Infiltration System	Sampling Frequency During Discharge to Surface Water
Volatile Organic Compounds[d]	First week, then every six months[c]	TBD
Pesticides[d]	First week, then every six months[c]	TBD
PCBs[d]	First week, then every six months[c]	TBD
TPH[d]	First week, then every six months[c]	TBD
Other		
Benzo(a)pyrene	First week, then annually	TBD
Radionuclides	First week, then annually	TBD

[a] Recommendation will be provided in NPDES permit application.

[b] Turbidity is continuously monitored as WWTP operational parameter to detect failure or deterioration of membrane treatment system.

[c] Monthly monitoring will continue for any compound detected at greater than 80 percent of its effluent limit. Otherwise, monitoring frequency will be reduced to annually.

[d] See list in Table 2-2 of the QAPP (Parametrix, 2002).

Where appropriate, sample labels and forms will be preprinted with the appropriate sample identification code. The labels will be filled out using waterproof ink and will be firmly affixed to the sample containers and protected with waterproof tape.

The following information will be given on each sample label:

- Project name and number.
- Name of sampler.
- Date and time of sample collection.
- Sample station.
- Sample number.
- Analysis required.
- Preservation.

2.2.2 Quality Control Samples

The following quality control samples should be collected at the WWTP to verify accuracy and precision of laboratory results for this project:

- A minimum of one trip blank will be analyzed each sampling event for VOC samples. If contamination is identified, transfer blanks will be collected and analyzed.
- A minimum of one blind duplicate will be analyzed per 20 samples, or one per year (whichever is greater).

The frequency of quality control samples may be adjusted when the final sampling schedule is determined. The frequency of quality control sample evaluations described here should be considered a minimum. Additional information regarding quality control is presented in the *Quality Assurance Project Plan* (QAPP) (Parametrix, 2002).

2.2.3 Documentation

Sample documents will be carefully prepared so that sample identification and chain-of-custody can be maintained and sample disposition controlled. Sample identification documents will include:

- Monitoring notebooks.
- Sample Data Sheet.
- Sample labels.
- Chain-of-Custody Forms.

Examples of the Sample Data Sheet, Sample Label, and Chain-of-Custody Form are included in Appendix A. Additional information regarding sample handling and custody is provided in the QAPP (Parametrix, 2002).

2.2.4 Sample Handling and Custody

Detailed information regarding sample handling and custody is provided in the QAPP (Parametrix, 2002). In summary, the following transfer of custody and shipment procedures will be followed:

- Each cooler in which samples are packed must be accompanied by a Chain-of-Custody Form. When transferring samples, the individuals relinquishing and receiving the samples must sign, date, and note the time on the Chain-of-Custody Form to document sample custody transfer.
- Shipping containers will be sealed with custody seals for shipment to the laboratory. The method of shipment, name of courier, and other pertinent information will be entered in the "Remarks" section of the Chain-of-Custody Form.
- All shipments will be accompanied by the Chain-of-Custody Form identifying shipment contents. The original form will accompany the shipment. The other copies will be distributed as appropriate to the Project QA Officer and Project Manager. See QAPP (Parametrix, 2002) for list of items to be included on the Chain-of-Custody Form.

The samples will be transported and handled in a manner that not only protects the integrity of the sample, but also prevents any detrimental effects due to the possible hazardous nature of the samples. Samples will be personally delivered by a Tulalip Tribes employee, or shipped via courier or overnight delivery service to the analytical laboratory within 24 hours of sample collection.

If sent by mail, the package will be registered with "Return Receipt Requested." If sent by common carrier, a bill of lading will be used. Freight bills, postal services receipts, and bills of lading will be retained as part of the permanent documentation.

Copies of the Sample Monitoring Data Sheet, the Sample Container Label, the Chain-of-Custody Form, and Chain-of-Custody Seal are included in Appendix A.

2.2.5 Groundwater Level Measurement

A standard operating procedure for groundwater level measurement is provided in Appendix B. Groundwater level measurements will be recorded in a monitoring notebook. Health and safety measures shall be rubber gloves and suitable clothes (boots, long pants, long sleeve shirt, etc.)

2.3 SAMPLE ANALYSES

The wastewater effluent samples will be analyzed by a Washington State certified laboratory for parameters with drinking water MCLs, and for additional conventional and instrument parameters used to assess treatment performance. Analytical methods and required reporting limits are provided in Table 2-2 in the QAPP (Parametrix, 2002).

Table 2-2 specifies information regarding sample containers, preservatives, and holding times.

Table 2-2. Sample Containers, Preservatives, and Holding Times

Analyses	Sample Container	Container Size (ml)	Preservation and Handling	Holding Times[a, b, c]	Sampling Method
Nitrate, nitrite, BOD_5	HDPE[d]	1,000	Cool to 4°C	48 hours	24-Hour Composite
Ammonia, TKN	HDPE	500	H_2SO_4 Cool to 4°C	28 days	24-Hour Composite
Fecal coliform, total coliform, *E. coli*	Corning	4 oz	NaOH Cool to 4°C Add 0.008% $Na_2S_2O_3$ if residual chlorine is present	24 hours	24-Hour Composite
Total suspended solids	HDPE	1,000	Cool to 4°C	7 days	24-Hour Composite
Cyanide	HDPE	500	NaOH to pH >12 Cool to 4°C	14 days	24-Hour Composite
Metals (except mercury) hardness, alkalinity	HDPE	1,000	HNO_3 to pH <2	6 months	24-Hour Composite
Mercury	HDPE	500	HNO_3 to pH <2	28 days	24-Hour Composite
Volatile organics	Glass vial; Teflon-lined-silicon septum cap	40 x 2	Fill bottles leaving no air space; keep in dark; cool to 4°C; HCL to pH <2	7 days; 14 days if preserved	Grab

(Table Continues)

Table 2-2. Sample Containers, Preservatives, and Holding Times (Continued)

Analyses	Sample Container	Container Size (ml)	Preservation and Handling	Holding Times[a, b, c]	Sampling Method
Pesticides	Amber glass with Teflon-lined lid	1,000	Cool to 4°C	7 days until extraction; 40 days after extraction until analysis	24-Hour Composite
PCBs	Amber glass with Teflon-lined lid	1,000	Cool to 4°C	7 days until extraction; 40 days after extraction until analysis	24-Hour Composite
Total petroleum hydrocarbons	Glass	1,000	Cool to 4°C	7 days	24-Hour Composite
Benzo(a)pyrene	Amber glass with Teflon-lined lid	500	None	7 days until extraction; 40 days after extraction until analysis	24-Hour Composite
Radionuclides:					
• Alpha/Beta	Plastic	1 Liter	Nitric Acid	180 days	24-Hour Composite
• Ra226/228	Plastic	1 Liter	Nitric Acid	180 days	24-Hour Composite

[a] EPA 1983. *Methods for Chemical Analysis of Water and Wastes.*

[b] EPA 1986. *Test Methods for Evaluating Solid Waste (SW-846)*, 3rd Edition.

[c] APHA – AWWA – WPCF 1989. *Standard Methods for the Examination of Waste and Wastewater*, 17th Edition.

[d] HDPE = High-density polyethylene.

3. DATA ANALYSIS AND REPORTING

The data results will be verified and validated in accordance with the *Quality Assurance Project Plan* (Parametrix, 2002).

Quarterly, the Project Coordinator must prepare a quality report for the Project Manager as described in the QAPP.

4. REFERENCES

Parametrix, Inc. 2002. *Tulalip Wastewater Treatment Plant Effluent Monitoring Program, Quality Assurance Project Plan.* Prepared for the Tulalip Tribes, Marysville, Washington.

APPENDIX A

Example Forms

Chain of Custody Record & Laboratory Analysis Request

Page _____ of _____

Number of coolers: _____

Cooler Temp: _____

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
(206) 621-6490
(206) 621-7523 (Fax)

ARI Client: Phone#:

Client Contact:

Client Project ID:

Samplers:

	Sample ID	Date	Time	Matx	No Cont	Lab ID	Analysis Required								Notes/Comments
1															
2															
3															
4															
5															
6															
7															

ARI Project No:

T.A.T. Requested:

Comments/Special Instructions:

Relinquished by: (Signature)	Relinquished by: (Signature)	Relinquished by: (Signature)
Printed Name:	Printed Name:	Printed Name:
Company:	Company:	Company:
Date: Time:	Date: Time:	Date: Time:
Received by: (Signature)	**Received by: (Signature)**	**Received by: (Signature)**
Printed Name:	Printed Name:	Printed Name:
Company:	Company:	Company:
Date: Time:	Date: Time:	Date: Time:

Chain of Custody

CLIENT _____

DATE _____

Parametrix, Inc.

Parametrix, Inc.

Client: _____ Project: _____

Sample _____ Site _____

Date _____ Time _____ Sampler _____

Analysis _____

Comments: _____

_____

Well #: _____

Sample #: _____

Groundwater Sampling Field Data Sheet

Project Number: _____ Date: _____

Project Name: _____ Location: _____

Project Address: _____ Sampled By: _____

Client Name: _____ Purged By: _____

Casing Diameter: 2" _____ 4" _____ 6" _____ Other _____

Depth to Water (feet): _____ Purge Volume Measurement Method: _____

Depth of Well (feet): _____ Date Purged: _____

Reference Point (surveyors notch, etc.): _____ Purge Time (from/to): _____

Date/Time Sampled: _____

Purge Volume Calculation: $(\pi r^2 h)(7.48\ gal/ft^3)$(5 casing volumes)

Purge Volume (gallons) for: 2" = (0.80)(h); 4" = (3.26)(h); 6" = (7.40)(h)

Calculated Purge Volume (gallons): _____ Actual Purge Volume (gallons): _____

TIME (2400 hr)	CUMULATIVE VOLUME (gal)	PH (units)	Ec (µmhos/cm 25° c)	COLOR (visual)	TURBIDITY (visual)	ODOR	OTHER

Purging Equipment: _____ Sampling Equipment: _____

Laboratory: _____ Date Sent to Lab: _____

Chain-of-Custody (yes/no): _____ Field QC Sample Number: _____

Shipment Method: _____ Split with (name(s)/organization(s): _____

Well Integrity: _____

Remarks: _____

Signature: _____

Field Report / Well Data

DATE	JOB NO.
PROJECT	
LOCATION	
CONTRACTOR	OWNER
WEATHER	TEMP °at AM °at PM
PRESENT AT SITE	

TO:

____

____

____

THE FOLLOWING WAS NOTED:

WN (WELL NUMBER)	TIME	DTW (DEPTH TO WATER)	MP (MEASURE POINT)	SU (STICK UP OF WELL CASING)	TD (TOTAL DEPTH OF WELL)	WD (WELL DIAMETER)

TOC (Top of Locking Casing) TOW (Top of Well Casing)

Parametrix, Inc.

COPIES TO: ______________________________ SIGNED ______________________________

____

Field Report

DATE	JOB NO.	
PROJECT		
LOCATION		
CONTRACTOR	OWNER	
WEATHER	TEMP	° at AM ° at PM
PRESENT AT SITE		

TO

THE FOLLOWING WAS NOTED:

COPIES TO: _____

SIGNED _____

Parametrix, Inc.

Sample . yses Tracking Report

PROJECT NAME _____ PROJECT NO. _____ CLIENT _____

PMX SAMPLE NO.	SAMPLE DESCRIPTION	SAMPLING DATE/TIME	DATE SAMPLE SHIPPED	DATE/TIME LAB CONTACTED FOR SHIPMENT	DATE ANALYTICAL DATA RECEIVED	LABORATORY INVOICE NO.	DATE QUALITY ASSURED	DATE DATA SENT TO CLIENT	COMMENTS

APPENDIX B

Standard Operating Procedures

STANDARD OPERATING PROCEDURES

Static Water Level Measurement

OBJECTIVE

The objective of this standard operating procedure is to describe a method for collecting a static water level measurement. Measurements will be made from groundwater monitoring wells accurate to the nearest 0.01 foot from a standard reference point on the well casing.

MATERIALS

The following materials are required for the collection of static water level measurements:

- Well keys.
- Electronic water-level indicator.
- Weighted steel tape.
- Paper towels.
- Deionized water.
- Health and safety equipment.

PROCEDURE

The following steps will be taken during the collection of static water level measurements:

1. Unlock and open well. Verify well integrity.
2. Lower electronic water level indicator to the water surface.
3. When the sounder indicates that the indicator probe has contacted water, raise and lower the probe to verify exact point at which measurement should be taken.
4. Measure the depth to water, to the nearest 0.01 foot, from the reference point (notch or mark on well casing).
5. Record the measurement, to the nearest 0.01 foot, in the monitoring notebook or on the Groundwater Sampling Data Sheet.
6. Measure total well depth to the nearest 0.1 foot using weighted steel tape.
7. Replace well cap and close and lock protective well casing.

DECONTAMINATION

The following steps will be taken during decontamination of down-hole measuring equipment:

1. While winding the equipment up from the well, thoroughly rinse with deionized water.

2. Remove excess water from the equipment with clean paper towels prior to rewinding equipment on the reel.

NOTES

Measurements will be made under appropriate health and safety procedures. See SAP/QAPP (Parametrix, 2002).

Revised January 2003
February 2003

APPENDIX J-3

Sampling and Analysis Plan

Sampling and Analysis Plan

Quil Ceda Village Wastewater Treatment Plant Effluent Monitoring Program

Submitted by

The Tulalip Tribes
8802 27th Avenue NE
Tulalip, Washington 98271-9715

Prepared by

Parametrix
1231 Fryar Avenue
P.O. Box 460
Sumner, Washington 98390-1516
(253) 863-5128
www.parametrix.com

July 2002
Project No. 216-1598-012 (07/04)

CERTIFICATE OF ENGINEER

The technical material and data contained in this document were prepared under the supervision and direction of the undersigned, whose seal, as a professional engineer licensed to practice as such, is affixed below.

Lisa A. Gilbert

Prepared by Lisa A. Gilbert, R. G.

KENNETH THOMAS FELLOWS
STATE OF WASHINGTON
32135
REGISTERED
PROFESSIONAL ENGINEER

7/12/02

EXPIRES: 01/05/04

Checked by Kenneth T. Fellows, P.E.

Approved by Michael T. Ollivant, P.E.

TABLE OF CONTENTS

1. INTRODUCTION 1-1

2. SAMPLING AND ANALYSIS SPECIFICS 2-1

2.1 LOCATION AND SAMPLE FREQUENCY 2-1

2.2 SAMPLING METHODS 2-1

2.2.1 Procedures for Sample Collection 2-1

2.2.2 Quality Control Samples 2-3

2.2.3 Documentation 2-4

2.2.4 Sample Handling and Custody 2-4

2.2.5 Groundwater Level Measurement 2-5

2.3 SAMPLE ANALYSES 2-5

3. DATA ANALYSIS AND REPORTING 3-1

4. REFERENCES 4-1

LIST OF TABLES

2-1 Sampling Frequency 2-2

2-2 Sample Containers, Preservatives, and Holding Times 2-6

APPENDICES

A Example Forms

B Standard Operating Procedures

ACRONYMS

EPA	U.S. Environmental Protection Agency
MCL	maximum contaminant level
QAPP	*Quality Assurance Project Plan*
SAP	Sampling and Analysis Plan
TBD	To Be Determined
UV	ultraviolet

1. INTRODUCTION

This Sampling and Analysis Plan has been developed for collection of wastewater effluent samples from the Kubota Membrane wastewater treatment plant operated by Quil Ceda Village.

This Sampling and Analysis Plan (SAP) was prepared considering two discharge options. Initially, the discharge will be routed to subsurface infiltration basins. Later, the discharge may be directed to surface water, if an NPDES Permit is obtained.

2. SAMPLING AND ANALYSIS SPECIFICS

2.1 LOCATION AND SAMPLE FREQUENCY

Wastewater effluent samples will be collected at the wastewater treatment plant at a location selected to represent the quality of effluent that will be discharged to the infiltration area or surface water (as applicable).

The frequency of sampling is indicated in Table 2-1 (see page 2-2). Compounds of concern for surface water discharge will be monitored during effluent infiltration to build a database of results prior to discharge to surface water. Analytical methods are described in Table 2-2 of the QAPP (Parametrix, 2002).

2.2 SAMPLING METHODS

2.2.1 Procedures for Sample Collection

Wastewater effluent samples will be collected directly into prelabeled sampling containers. Therefore no decontamination will be required. Each sample will be labeled, chemically preserved (if required), and sealed immediately after collection.

Prior to the sample event, each sample location will be assigned a unique code. Each sample collected at that location would be preassigned an identification code using the sample location followed by other specific information describing the sample. The following example illustrates the sample identification system:

EF-122002-001-0,

Where:

EF	=	Effluent
122002	=	Date
001	=	Station Number
0	=	Code indicating whether the sample is a duplicate, where 0 is assigned for the sample, and 1 is assigned for a duplicate sample.

Table 2-1. Sampling Frequency

Parameter or Parameter Group	Sampling Frequency During Discharge to Effluent Infiltration System	Sampling Frequency During Discharge to Surface Water[a]
Groundwater Level Measurements	Weekly (N1 through N10, S1 through S9, and B1 through B6, and P3).	None
Instrument Parameters		
Dissolved oxygen	Weekly	To Be Determined (TBD)
pH	Weekly	TBD
Specific conductance	Weekly	TBD
Turbidity	Continuous[b]	TBD
Conventional Parameters		
Alkalinity	Monthly for first year of operation	TBD
Ammonia	Weekly	TBD
BOD5	Weekly	TBD
Coliform, Fecal	Weekly	TBD
Coliforms, Total	First week, at 6 months, at 12 months	TBD
E. coli	First week, at 6 months, at 12 months	TBD
Cyanide	First week, at 6 months, at 12 months	TBD
Hardness	Monthly	TBD
Nitrate	Weekly	TBD
Nitrite	Weekly	TBD
Phosphorous	First week, at 6 months, at 12 months	TBD
TKN	Weekly	TBD
TSS	Monthly for first year of operation. Use turbidity as surrogate thereafter.	TBD
Metals		
Antimony	Monthly for first 3 months[c]	TBD
Arsenic	Monthly for first 3 months[c]	TBD
Barium	Monthly for first 3 months[c]	TBD
Beryllium	Monthly for first 3 months[c]	TBD
Cadmium	Monthly for first 3 months[c]	TBD
Chromium	Monthly for first 3 months[c]	TBD
Copper	Monthly for first 3 months[c]	TBD
Lead	Monthly for first 3 months[c]	TBD
Mercury	Monthly for first 3 months[c]	TBD
Nickel	Monthly for first 3 months[c]	TBD
Selenium	Monthly for first 3 months[c]	TBD
Silver	Monthly for first 3 months[c]	TBD
Thallium	Monthly for first 3 months[c]	TBD
Zinc	Monthly for first 3 months[c]	TBD

(Table Continues)

Table 2-1. Sampling Frequency (Continued)

Parameter or Parameter Group	Sampling Frequency During Discharge to Effluent Infiltration System	Sampling Frequency During Discharge to Surface Water
Volatile Organic Compounds[d]	First week, then every six months[c]	TBD
Pesticides[d]	First week, then every six months[c]	TBD
PCBs[d]	First week, then every six months[c]	TBD
TPH[d]	First week, then every six months[c]	TBD

[a] Recommendation will be provided in NPDES permit application.

[b] Turbidity is continuously monitored as WWTP operational parameter to detect failure or deterioration of membrane treatment system.

[c] Monthly monitoring will continue for any compound detected at greater than 80 percent of its effluent limit. Otherwise, monitoring frequency will be reduced to annually.

[d] See list in Table 2-2 of the QAPP (Parametrix, 2002).

Where appropriate, sample labels and forms will be preprinted with the appropriate sample identification code. The labels will be filled out using waterproof ink and will be firmly affixed to the sample containers and protected with waterproof tape.

The following information will be given on each sample label:

- Project name and number.
- Name of sampler.
- Date and time of sample collection.
- Sample station.
- Sample number.
- Analysis required.
- Preservation.

2.2.2 Quality Control Samples

The following quality control samples should be collected at the WWTP to verify accuracy and precision of laboratory results for this project:

- A minimum of one trip blank will be analyzed each sampling event for VOC samples. If contamination is identified, transfer blanks will be collected and analyzed.
- A minimum of one blind duplicate will be analyzed per 20 samples, or one per year (whichever is greater).

The frequency of quality control samples may be adjusted when the final sampling schedule is determined. The frequency of quality control sample evaluations described here should be considered a minimum. Additional information regarding quality control is presented in the *Quality Assurance Project Plan* (QAPP) (Parametrix, 2002).

2.2.3 Documentation

Sample documents will be carefully prepared so that sample identification and chain-of-custody can be maintained and sample disposition controlled. Sample identification documents will include:

- Monitoring notebooks.
- Sample Data Sheet.
- Sample labels.
- Chain-of-Custody Forms.

Examples of the Sample Data Sheet, Sample Label, and Chain-of-Custody Form are included in Appendix A. Additional information regarding sample handling and custody is provided in the QAPP (Parametrix, 2002).

2.2.4 Sample Handling and Custody

Detailed information regarding sample handling and custody is provided in the QAPP (Parametrix, 2002). In summary, the following transfer of custody and shipment procedures will be followed:

- Each cooler in which samples are packed must be accompanied by a Chain-of-Custody Form. When transferring samples, the individuals relinquishing and receiving the samples must sign, date, and note the time on the Chain-of-Custody Form to document sample custody transfer.
- Shipping containers will be sealed with custody seals for shipment to the laboratory. The method of shipment, name of courier, and other pertinent information will be entered in the "Remarks" section of the Chain-of-Custody Form.
- All shipments will be accompanied by the Chain-of-Custody Form identifying shipment contents. The original form will accompany the shipment. The other copies will be distributed as appropriate to the Project QA Officer and Project Manager. See QAPP (Parametrix, 2002) for list of items to be included on the Chain-of-Custody Form.

The samples will be transported and handled in a manner that not only protects the integrity of the sample, but also prevents any detrimental effects due to the possible hazardous nature of the samples. Samples will be personally delivered by a Tulalip Tribes employee, or shipped via courier or overnight delivery service to the analytical laboratory within 24 hours of sample collection.

If sent by mail, the package will be registered with "Return Receipt Requested." If sent by common carrier, a bill of lading will be used. Freight bills, postal services receipts, and bills of lading will be retained as part of the permanent documentation.

Copies of the Sample Monitoring Data Sheet, the Sample Container Label, the Chain-of-Custody Form, and Chain-of-Custody Seal are included in Appendix A.

2.2.5 Groundwater Level Measurement

A standard operating procedure for groundwater level measurement is provided in Appendix B. Groundwater level measurements will be recorded in a monitoring notebook. Health and safety measures shall be rubber gloves and suitable clothes (boots, long pants, long sleeve shirt, etc.)

2.3 SAMPLE ANALYSES

The wastewater effluent samples will be analyzed by a Washington State certified laboratory for parameters with drinking water MCLs, and for additional conventional and instrument parameters used to assess treatment performance. Analytical methods and required reporting limits are provided in Table 2-2 in the QAPP (Parametrix, 2002).

Table 2-2 specifies information regarding sample containers, preservatives, and holding times.

Table 2-2. Sample Containers, Preservatives, and Holding Times

Analyses	Sample Container	Container Size (ml)	Preservation and Handling	Holding Times[a, b, c]	Sampling Method
Nitrate, nitrite, BOD5, total suspended solids, alkalinity	HDPE[d]	1,000	Cool to 4°C	48 hours	24-Hour Composite
Ammonia, TKN	HDPE	500	H_2SO_4	28 days	24-Hour Composite
Fecal coliform, total coliform, *E. coli*	Corning	4 oz	NaOH	24 hours	24-Hour Composite
Cyanide	HDPE	1,000	NaOH	14 days	24-Hour Composite
Total petroleum hydrocarbons	Glass	1,000	Cool to 4°C	7 days	24-Hour Composite
Mercury	HDPE	1,000	HNO_3 to pH <2 for total metal, none for dissolved metal	28 days	24-Hour Composite
Metals (except mercury), hardness		1,000	HNO_3 to pH <2 for total metal, none for dissolved metal	6 months	24-Hour Composite
Volatile Organics	Glass vial; Teflon-lined-silicon septum cap	40 x 2	Fill bottles leaving no air space Keep in dark, cool to 4°C; HCL to pH <2	7 days; 14 days if preserved	Grab
Pesticides	Amber glass with Teflon-lined lid	1,000	Cool to 4°C	7 days until extraction; 40 days after extraction until analysis	24-Hour Composite
PCBs	Amber glass with Teflon-lined lid	1,000	Cool to 4°C	7 days until extraction; 40 days after extraction until analysis	24-Hour Composite
Dissolved oxygen, specific conductivity, turbidity, pH	None – instrument method	NA	NA	NA	Grab

[a] EPA 1983. *Methods for Chemical Analysis of Water and Wastes.*

[b] EPA 1986. *Test Methods for Evaluating Solid Waste* (SW-846), 3rd Edition.

[c] APHA – AWWA — WPCF 1989. *Standard Methods for the Examination of Waste and Wastewater*, 17th Edition.

[d] HDPE = High-density polyethylene.

3. DATA ANALYSIS AND REPORTING

The data results will be verified and validated in accordance with the *Quality Assurance Project Plan* (Parametrix, 2002).

Quarterly, the Project Coordinator must prepare a quality report for the Project Manager as described in the QAPP.

4. REFERENCES

Parametrix, Inc. 2002. *Tulalip Wastewater Treatment Plant Effluent Monitoring Program, Quality Assurance Project Plan.* Prepared for the Tulalip Tribes, Marysville, Washington.

APPENDIX A

Example Forms

Chain of Custody Record & Laboratory Analysis Request

L _____

Page _____ of _____

Number of coolers: _____

Cooler Temp: _____

Analytical Resources, Incorporated
Analytical Chemists and Consultants
400 Ninth Avenue North
Seattle, WA 98109-4708
(206) 621-6490
(206) 621-7523 (Fax)

ARI Client: Phone#:

Client Contact:

Client Project ID:

Samplers:

	Sample ID	Date	Time	Matx	No Cont	Lab ID	Analysis Required								Notes/Comments
1															
2															
3															
4															
5															
6															
7															

ARI Project No:

T.A.T. Requested:

Comments/Special Instructions:

Relinquished by: (Signature)	Relinquished by: (Signature)	Relinquished by: (Signature)
Printed Name:	Printed Name:	Printed Name:
Company:	Company:	Company:
Date: Time:	Date: Time:	Date: Time:
Received by: (Signature)	Received by: (Signature)	Received by: (Signature)
Printed Name:	Printed Name:	Printed Name:
Company:	Company:	Company:
Date: Time:	Date: Time:	Date: Time:

Chain of Custody

CLIENT _____

DATE _____

Parametrix, Inc.

Parametrix, Inc.

Client: _____ Project: _____

Sample _____ Site _____

Date _____ Time _____ Sampler _____

Analysis _____

Comments: _____

_____

Well #: _____

Sample #: _____

Groundwater Sampling Field Data Sheet

Project Number: _____ Date: _____

Project Name: _____ Location: _____

Project Address: _____ Sampled By: _____

Client Name: _____ Purged By: _____

Casing Diameter: 2" _____ 4" _____ 6" _____ Other _____

Depth to Water (feet): _____ Purge Volume Measurement Method: _____

Depth of Well (feet): _____ Date Purged: _____

Reference Point (surveyors notch, etc.): _____ Purge Time (from/to): _____

Date/Time Sampled: _____

Purge Volume Calculation: $(\pi r^2 h)(7.48\ gal/ft^3)$(5 casing volumes)

Purge Volume (gallons) for: 2" = (0.80)(h); 4" = (3.26)(h); 6" = (7.40)(h)

Calculated Purge Volume (gallons): _____ Actual Purge Volume (gallons): _____

TIME (2400 hr)	CUMULATIVE VOLUME (gal)	PH (units)	Ec (µmhos/cm 25° c)	COLOR (visual)	TURBIDITY (visual)	ODOR	OTHER

Purging Equipment: _____ Sampling Equipment: _____

Laboratory: _____ Date Sent to Lab: _____

Chain-of-Custody (yes/no): _____ Field QC Sample Number: _____

Shipment Method: _____ Split with (name(s)/organization(s): _____

Well Integrity: _____

Remarks: _____

Signature: _____ Page ____ of ____

Field Report / Well Data

DATE	JOB NO.
PROJECT	
LOCATION	
CONTRACTOR	OWNER
WEATHER	TEMP °at AM °at PM
PRESENT AT SITE	

TO:

THE FOLLOWING WAS NOTED:

WN (WELL NUMBER)	TIME	DTW (DEPTH TO WATER)	MP (MEASURE POINT)	SU (STICK UP OF WELL CASING)	TD (TOTAL DEPTH OF WELL)	WD (WELL DIAMETER)

TOC (Top of Locking Casing) TOW (Top of Well Casing)

Parametrix, Inc.

COPIES TO: _____ SIGNED _____

Field Report

DATE	JOB NO.
PROJECT	
LOCATION	
CONTRACTOR	OWNER
WEATHER	TEMP ° at AM ° at PM
PRESENT AT SITE	

TO

THE FOLLOWING WAS NOTED:

COPIES TO: _____

SIGNED _____

Parametrix, Inc.

Sample Analyses Tracking Report

PROJECT NAME _____ PROJECT NO. _____ CLIENT _____

PMX SAMPLE NO.	SAMPLE DESCRIPTION	SAMPLING DATE/TIME	DATE SAMPLE SHIPPED	DATE/TIME LAB CONTACTED FOR SHIPMENT	DATE ANALYTICAL DATA RECEIVED	LABORATORY INVOICE NO.	DATE QUALITY ASSURED	DATE DATA SENT TO CLIENT	COMMENTS

APPENDIX B

Standard Operating Procedures

STANDARD OPERATING PROCEDURES

Static Water Level Measurement

OBJECTIVE

The objective of this standard operating procedure is to describe a method for collecting a static water level measurement. Measurements will be made from groundwater monitoring wells accurate to the nearest 0.01 foot from a standard reference point on the well casing.

MATERIALS

The following materials are required for the collection of static water level measurements:

- Well keys.
- Electronic water-level indicator.
- Weighted steel tape.
- Paper towels.
- Deionized water.
- Health and safety equipment.

PROCEDURE

The following steps will be taken during the collection of static water level measurements:

1. Unlock and open well. Verify well integrity.
2. Lower electronic water level indicator to the water surface.
3. When the sounder indicates that the indicator probe has contacted water, raise and lower the probe to verify exact point at which measurement should be taken.
4. Measure the depth to water, to the nearest 0.01 foot, from the reference point (notch or mark on well casing).
5. Record the measurement, to the nearest 0.01 foot, in the monitoring notebook or on the Groundwater Sampling Data Sheet.
6. Measure total well depth to the nearest 0.1 foot using weighted steel tape.
7. Replace well cap and close and lock protective well casing.

DECONTAMINATION

The following steps will be taken during decontamination of down-hole measuring equipment:

1. While winding the equipment up from the well, thoroughly rinse with deionized water.

2. Remove excess water from the equipment with clean paper towels prior to rewinding equipment on the reel.

NOTES

Measurements will be made under appropriate health and safety procedures. See SAP/QAPP (Parametrix, 2002).